CLAIMS

1. Process for generating an intermediate laminated product in an aluminium alloy of the Al-Zn-Mg type, including the following steps:

a) by semi-continuous casting a plate is generated containing (in percentages per unit mass)

Mg 0.5 – 2.0 Mn < 1.0 Zn 3.0 – 9.0 Si < 0.50

Fe< 0.50 Cu < 0.50 Ti < 0.15 Zr < 0.20

Cr < 0.50

the remainder of the aluminium with its inevitable impurities, in which Zn/Mg > 1.7;

b) said plate is subjected to homogenisation or reheating to a temperature T_1, selected so that $500°C \leq T_1 \leq (T_S - 20°C)$, where T_S is the alloy burning temperature,

c) an initial hot-rolling step is carried out including one or more roll runs on a hot rolling mill, the input temperature T_2 being selected such that $(T_1 - 60°C) \leq T_2 \leq (T_1 - 5°C)$, and the rolling process being conducted in such a way that the output temperature T_3 is such that $(T_1 - 150°C) \leq T_3 \leq (T_1 - 30°C)$ and $T_3 \leq T_2$;

d) the strip emerging from said initial hot-rolling step is cooled to a temperature T_4;

e) a second step of hot-rolling said strip is carried out, the input temperature T_5 being selected such that $T_5 \leq T_4$ and $200°C \leq T_5 \leq 300°C$, and the rolling process being conducted in such a way that the coiling temperature T_6 is such that $(T_5 - 150°C) \leq T_6 \leq (T_5 - 20°C)$.

2. Process according to claim 1, characterised in that the zinc content of the alloy is between 4.0 and 6.0%, the Mg content is between 0.7 and 1.5%, and the Mn content is less than 0.60%.

3. Process according to claim 2, characterised in that Cu < 0.25%.

4. Process according to claim 2, characterised in that the alloy is chosen from the group formed by the alloys 7020, 7108, 7003, 7004, 7005, 7008, 7011, 7022.

5. Process according to any one of claims 1 to 3, characterised in that the alloy additionally contains one or more elements chosen from the group formed by Sc, Y, La, Dy, Ho, Er, Tm, Lu, Hf, Yb with a concentration not exceeding the following values:

Sc < 0.50% and preferably < 0.20%,

Y < 0.34% and preferably < 0.17%,

La, Dy, Ho, Er, Tm, Lu < 0.10% each and preferably < 0.05% each,

Hf < 1.20% and preferably < 0.50%,

Yb < 0.50% and preferably < 0.25%.

6. Process according to any one of claims 1 to 5, characterised in that said intermediate laminated product has a thickness between 3 mm and 12 mm.

7. Process according to any one of claims 1 to 6, characterised in that said intermediate laminated product is subjected to cold working between 1% and 9%, and/or to an additional heat treatment including one or more points at temperatures between 80°C and 250°C, said additional heat treatment being able to occur before, after or during said cold working.

8. Process according to any one of claims 1 to 7, characterised in that the temperature T_3 is such that $(T_1 - 100°C) \leq T_3 \leq (T_1 - 30°C)$ and/or in that the temperature T_2 is such that $(T_1 - 30°C) \leq T_2 \leq (T_1 - 5°C)$.

9. Process according to any one of claims 1 to 8, characterised in that the temperature T_3 is greater than the solvus temperature of the alloy.

10. Process according to any one of claims 1 to 9, characterised in that the alloy is 7108 alloy and the temperatures T_1 to T_6 are respectively $T_1 = 550°C$, $T_2 = 540°C$, $T_3 = 490°C$, $T_4 = 270°C$, $T_5 = 270°C$, $T_6 = 150°C$.

11. Product which can be obtained via the process according to any one of claims 1 to 10, characterised in that its yield strength $R_{p0.2}$ is at least 250 Mpa, its fracture strength R_m is at least 280 MPa, and its elongation at fracture is at least 8%.

12. Product according to claim 11, characterised in that its yield strength $R_{p0.2}$ is at least 290 MPa and that its fracture strength R_m is at least 330 MPa.

13. Product according to any one of claims 11 or 12, characterised in that the zinc content is between 4.0 and 6.0%, its Mg content is between 0.7 and 1.5%, and its Mn content less than 0.60% (and preferably less than 0.25%).

14. Product according to claim 13, characterised in that its copper content is less than 0.25%.

15. Product according to any one of claims 13 or 14, characterised in that the width of the precipitation-free zones at the grain boundaries is more than 100 nm, preferably between 100 nm and 150 nm, and even more preferably from 120 nm to 140 nm.

16. Product according to claim 15, characterised in that that $MgZn_2$ type precipitations at the grain boundaries have an average size of more than 150 nm, and preferably between 200 nm and 400 nm.

17. Product according to any one of claims 11 to 16, characterised in that it has a fibrous structure with grains exhibiting in the short-transverse direction a thickness of less than 30 μm, preferably less than 15 μm, and even more preferably less than 10 μm.

18. Product according to claim 17, characterised in that it has a fibrous structure characterised by a thickness/length of grains ratio of more than 60, and preferably more than 100.

19. Use of a laminated product according to any one of claims 11 to 18 to manufacture welded constructions.

20. Use of a laminated product according to any one of claims 11 to 18 to build road or rail tankers.

21. Use of a laminated product according to any one of claims 11 to 18 to build industrial vehicles.

22. Use of a laminated product according to any one of claims 11 to 18 to build equipment for storage, transport or handling of granulous products, such as buckets, tanks or conveyors.

23. Use of a laminated product according to any one of claims 11 to 18 to manufacture motor vehicle parts.

24. Use of a laminated product according to any one of claims 11 to 18 as a structural component in aeronautical construction.

25. Use according to claim 24, wherein said structural component is a fuselage facing sheet.

26. Use according to any one of claims 19 to 25, wherein at least two of said structural components are assembled by welding.

27. Welded construction made with at least two products according to any one of claims 11 to 18, characterised in that its yield strength $R_{p0.2}$ in the welded joint between two of said products is at least 200 MPa.

28. Welded construction according to claim 27, wherein the yield strength $R_{p0.2}$ in the welded joint between two of said products is at least 220 MPa.

29. Welded construction made with at least two products according to any one of claims 11 to 18, characterised in that its fracture strength R_m in the welded joint between two of said products is at least 250 MPa.

30. Welded construction according to claim 29, wherein the fracture strength R_m in the welded joint between two of said products is at least 300 MPa.

31. Welded construction according to any one of claims 27 to 30, wherein the hardness in the heat-affected zone is greater than or equal to 100 HV, preferably greater than or equal to 110 HV, and even more preferably greater than or equal to 115 HV.

32. Welded construction according to claim 31, wherein the hardness in the heat-affected zone is at least as great as the hardness of those of the base sheet that has the lowest level of hardness.